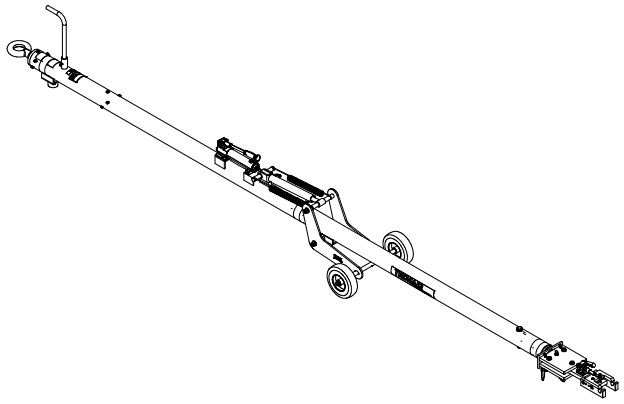
Operation & Service Manual



Models: 01-1297-0100
01A1297-0100
01B1297-0100
Custom Towbars
Embraer 170/175/190/195 Aircraft

CE

04/2009 – Rev. 01

Includes Illustrated Parts Lists

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Tronair towbars/heads must only be used with matching Tronair heads/towbars, and Tronair shear pins.

This product can not be modified without the written approval of Tronair, Inc. Any modifications done without written approval voids all warranties and releases Tronair, Inc., it suppliers, distributors, employees, or financial institutions from any liability from consequences that may occur. Only Tronair OEM replacement parts shall be used.

1.0 DESCRIPTION

The Tronair Model 01-1297-0100, 01A1297-0100 and 01B1297-0100 Custom Towbars are designed for towing the Embraer 170/175/190/195 Aircraft manufactured by Embraer.

The custom towbar includes a hydraulic operated landing gear to raise and lower the towing head. The aircraft attachment is by machined hooks on the towing head to the nose landing gear tow pin. There is a handle and an eyebolt at the end of the towbar for towing. The eyebolt incorporates a compression spring to dampen shock loads during towing.

1.1 SPECIFICATIONS

Aircraft Application: Embraer 170/175/190/195 manufactured by Embraer
Eyebolt:
01-1297-0010 2 3/16 in (5.6 cm) Standard
01A1297-0010 2 ⅞ in (7.3 cm)
01B1297-0010 3 in (7.62 cm)
Dimensions:
Length: 206.31 in (524 cm) From eyebolt centerline to aircraft attachment centerline.
Width: 24.2 in (61.5 cm)
Height: 22.125 in (56.2 cm)
Weight: 250 lbs (113.4 kg)
Finish:
Towbar: Blue Powder Coat
Towing Head: Zinc Plating

2.0 SAFETY INFORMATION

2.1 GENERAL

The Tronair Model 01-1297-0100, 01A1297-0100 and 01B1297-0100 Custom Towbars are used for moving the Embraer 170/175/190/195 Aircraft only.

To ensure safe operation, please read the following statements and understand their meaning. This manual contains safety precautions which are explained as follows. Please read carefully.

WARNING! Warning is used to indicate the presence of a hazard that can cause severe personal injury, death, and/or substantial property damage if the Warning Notice is ignored.

CAUTION! Caution is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage is the Caution Notice is ignored.

WARNING!

A damaged or bent towbar should not be used. Towbar should be repaired or replaced.

3.0 OPERATION

3.1 PRELIMINARY CHECKLIST

3.1.1 Towbar

— Check weld between towbar and pump mount for cracks.
— Check weld between towbar and cylinder mount for cracks.
— Check weld between towbar and handles for cracks.
— Check hydraulic connections for leaks.
— Check air pressure in tires; inflate/deflate as required.
— Check all fastener connections to ensure they are not loose or missing.

3.1.2 Towing Head

— Check welds between head plate, connector tube, and shear plates for cracks.
— Check shear pin to ensure it has not broken; replace if necessary.
— Check fastener connection of towing head to towbar. Ensure the connection is not loose or missing.
— Check shear pin bushings. Ensure they are not cracked or chipped.
— Check hooks on towing head for bending or excessive wear.
— Check pivot bolt. Ensure connection is secure.
— Check slide assembly; ensure ball detents plungers properly lock.
— Check all fastener connections to ensure they are not loose or missing.

3.2 USAGE PROCEDURE

3.2.1 Aircraft Attachment

CAUTION!

It is recommended that your towbar be attached to the aircraft first, and then connected to the tug to avoid possible aircraft damage.

— Ensure the slide block is locked in place using the detent ball plungers.

3.2.2 Tug Attachment

CAUTION!

Damage to the towbar or aircraft can result from an excessive towbar angle during towing operations. *Reference Figure 1.*

— Use a pintle height so that the towbar is as level as possible during towing. Also, the pintle hook height should prevent contact of the towbar with the ground during towing.

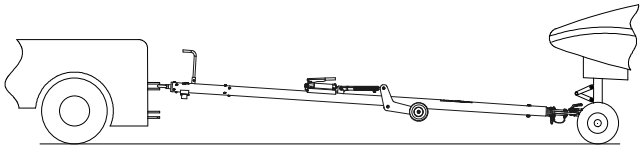


FIGURE 1 – Incorrect

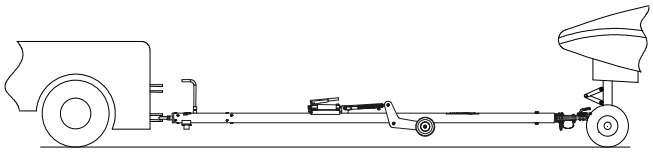


FIGURE 2 – Correct

3.2.3 Couplers

CAUTION!

Damage to the towbar or aircraft can result while towing with the following types of couplers:

- **Lift Head**
- **Standard Duty Latch**
- **Vertical Side Swing Latch**
- **Swivel Hook**

The couplers listed above are known to cause binding and failure in the towing eye. Indicators of binding are wear on outside diameter of the eyebolt and indentation on the inside diameter of the eyebolt. ***Reference Figure 3***.

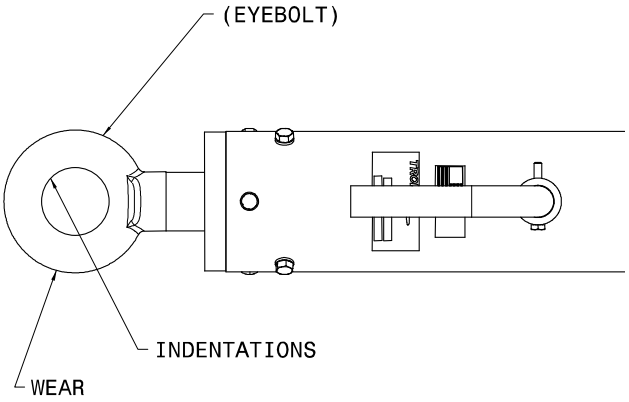


FIGURE 3

3.2.3 Couplers continued on following page.

3.2.3 Couplers *(continued)*

Tronair recommends a telecoupler pintle hook arrangement. This arrangement is known to eliminate binding. Tronair offers a Standard Telecoupler, Model Number 01-1950-5000, for use on tugs. ***Reference Figure 4.***

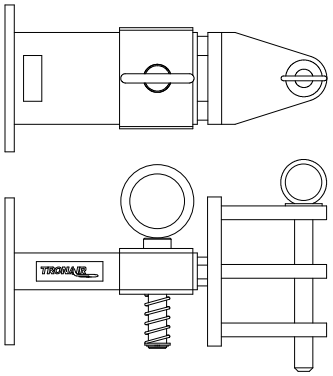


FIGURE 4
01-1950-5000 Standard Telecoupler

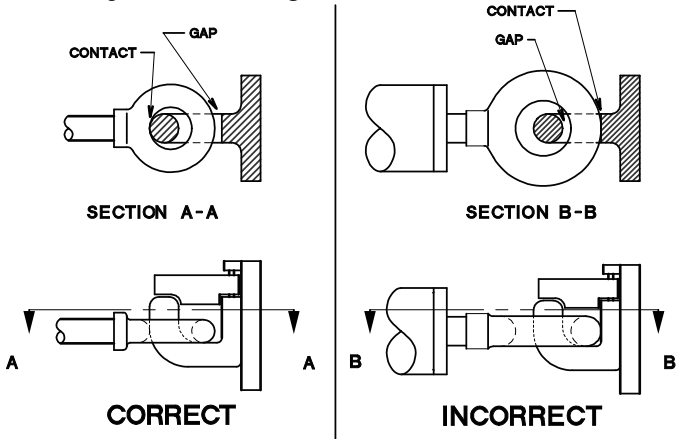


FIGURE 5

Damage to the towbar and/or aircraft can result by towing or pushing an aircraft with an incorrect size eyebolt or pintle pin. A correct size eyebolt will make contact with the pintle pin. A gap between the eyebolt outside diameter and the coupler face plate should be easily seen. An eyebolt which is too large will cause the eyebolt to make contact with the face plate of the coupler. When the eyebolt is too large for the coupler, a gap between the inside diameter of the eyebolt and the coupler face plate will be seen. ***Reference Figure 5.***

To ensure proper towing and pushing, check to make sure the pintle pin diameter is not too long for the eyebolt's inside diameter. An approximate one-half inch (1/2") gap between the pin diameter and the eyebolt should be seen. If any of these conditions are not met, please contact Tronair for information to obtain a new coupler.

3.2.4 Towing Operation

Damage to the towbar or aircraft can result from pushing an aircraft while maintaining too sharp of an angle between the tug and the aircraft. Contact between the towbar weldment and the tug must be avoided. It is recommended that the angle between the tug and towbar not exceed 90º. ***Reference Figure 6.***

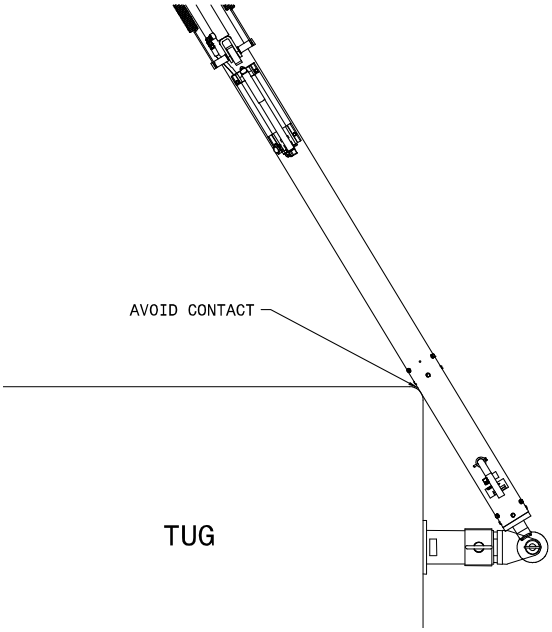


FIGURE 6

4.0 TRAINING

4.1 TRAINING REQUIREMENTS

The employer of the operator is responsible for providing a training program sufficient for the safe operation of the towbar.

4.2 TRAINING PROGRAM

The employer provided operator training program should cover safety procedures concerning use of the towbar in and around the Embraer 170/175/190/195 at the servicing location.

4.3 OPERATOR TRAINING

The operator training should provide the required training for safe operation of the towbar.

NOTE: Maintenance and Trouble Shooting are to be performed by the skilled and trained technician.

5.0 IN-SERVICE SUPPORT

Contact Tronair for technical services and information.

6.0 GUARANTEES/LIMITATION OF LIABILITY

Tronair products are warranted to be free of manufacturing or material defects for a period of one year after shipment to the original customer. This is solely limited to the repair or replacement of defective components. This warranty does not cover the following items:

a) Parts required for normal maintenance
b) Parts covered by a component manufacturers warranty
c) Replacement parts have a 90-day warranty from date of shipment

If you have a problem that may require service, contact Tronair immediately. Do not attempt to repair or disassemble a product without first contacting Tronair, any action may affect warranty coverage. When you contact Tronair be prepared to provide the following information:

a) Product Model Number
b) Product Serial Number
c) Description of the problem

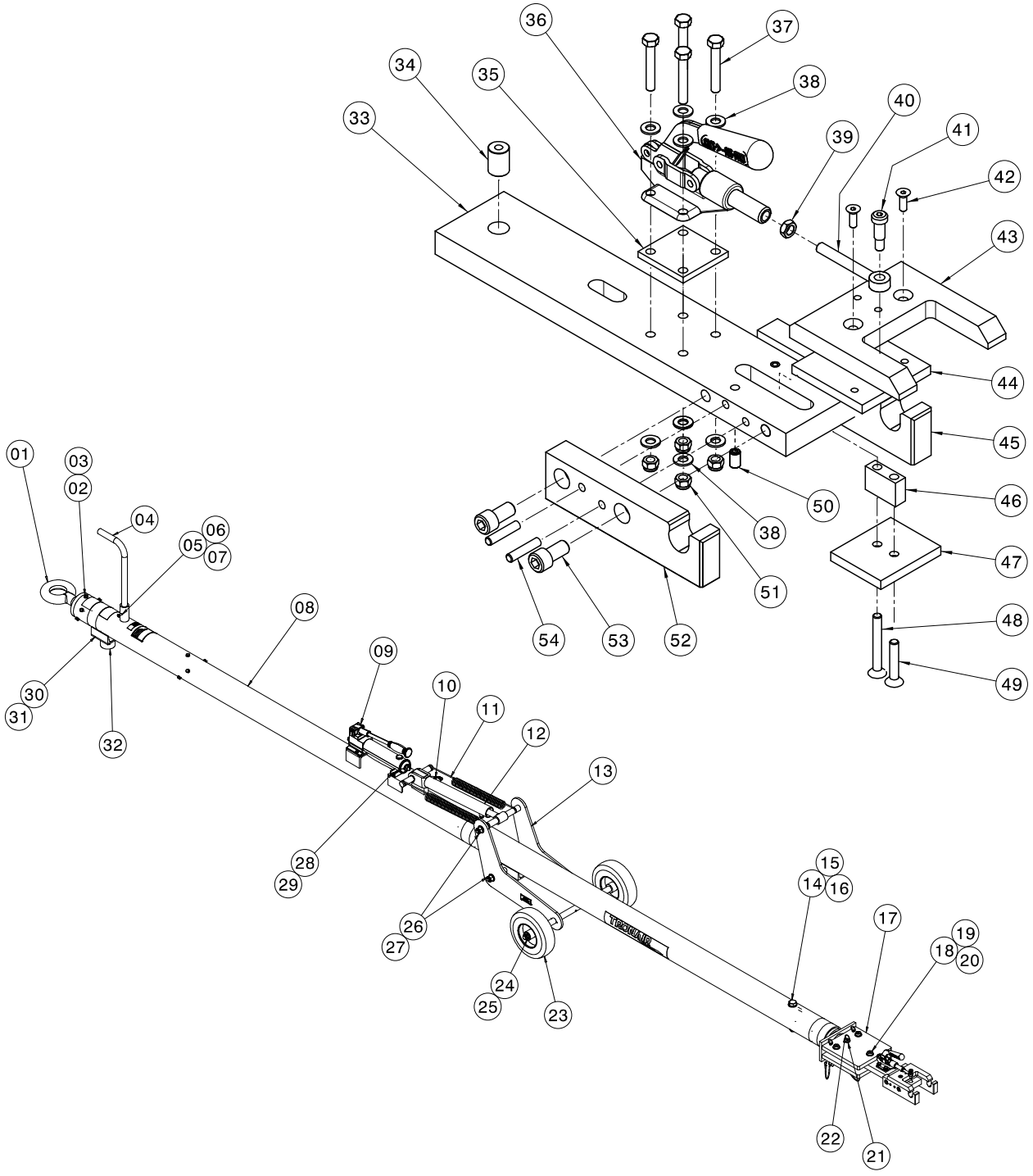
If warranty coverage is approved, either replacement parts will be sent or the product will have to be returned to Tronair for repairs. If the product is to be returned, a Return Material Authorization (RMA) number will be issued for reference purposes on any shipping documents. Failure to obtain a RMA in advance of returning an item will result in a service fee. A decision on the extent of warranty coverage on returned products is reserved pending inspection at Tronair. Any shipments to Tronair must be shipped freight prepaid. Freight costs on shipments to customers will be paid by Tronair on any warranty claims only. Any unauthorized modification of the Tronair products or use of the Tronair products in violation of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately void any warranty, express or implied.

The obligations of Tronair expressly stated herein are in lieu of all other warranties or conditions expressed or implied. **Any unauthorized modification of the Tronair products or use of the Tronair products in violations of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately *void any warranty, express or implied* and Tronair *disclaims any and all liability for injury (WITHOUT LIMITATION and including DEATH), loss or damage arising from or relating to such misuse*.**

Parts Lists

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty



1	Z-4753	Assembly, Shock (for 01-1297-0100)	1
	Z-4752	Assembly, Shock (for 01A1297-0100)	1
	Z-6355	Assembly, Shock (for 01B1297-0100)	1
2	G-1420-106012	Bolt, Hex Head Grade 8, 5/16-18 x 1 ¼ long	12
3	G-1251-1060R	Lock Washer, 5/16 Regular	12
4	TR-1857-01	Tube, Handle	1
5	G-1100-105520	Bolt, Hex Head Grade 5. ¼ -28 X 2" long	1
6	G-1250-1050N	Flatwasher, ¼ narrow	1

Parts Lists

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
7	G-1202-1055	Elastic Stopnut, ¼ - 28	3
8	Z-5593-01	Machining, Towbar	1
9	H-2945	Pump, Hydraulic	1
10	TF-1043-18*22.0	Assembly, Hose	1
11	H-2664	Spring, Extension	2
12	HC-2119	Cylinder, Hydraulic	1
13	J-3435-01	Plate, Landing Gear	2
14	G-1420-111554	Bolt, Hex Head Grade 8, ¾ -16 x 5 ½ " long	1
15	G-1250-1110N	Flatwasher, ¾ narrow	2
16	G-1203-1115	Elastic Jamnut, ¾ - 16	1
17	Z-5837-01	Machining, Shear Plate	1
18	G-1155-109226	Screw, Shoulder 5/8 diameter	3
19	G-1255-10	Washer, 5/8 AN	3
20	G-1202-1090	Elastic Stopnut, ½ - 13	3
21	H-1724-09	Bushing	2
22	G-1444-32	Shear Pin	3
23	U-1096	Wheel, Pneumatic	2
24	G-1250-1110N	Flatwasher, ¾ narrow	2
25	G-1203-1115	Elastic Jamnut, ¾ - 16	2
26	G-1250-1100N	Flatwasher, 5/8 narrow	4
27	G-1202-1105	Elastic Stopnut, 5/8 - 18	4
28	G-1100-105006	Bolt, Hex Head Grade 5. ¼ -20 x ¾ " long	4
29	G-1251-1050R	Lockwasher, ¼ regular	4
30	G-1000-105006	Bolt, Hex Head Grade 5. ¼ -20 x ¾ " long	4
31	G-1251-1050R	Lockwasher, ¼ regular	4
32	Z-5611	Assembly, Skid	1
33	J-3558	Machining, Head	1
34	H-1725-16	Bushing	1
35	J-3544	Spacer	1
36	H-2717	Clamp, Toggle	1
37	G-1100-106520	Bolt, Hex Head Grade 5. 5/16 -24 x 2" long	4
38	G-1250-1060N	Flatwasher, 5/16 narrow	8
39	G-1207-1070	Jamnut, 3/8 - 16	1
40	H-2722	Rod End	1
41	G-1155-106206	Screw, Shoulder, 3/8" diameter	1
42	G-1152-106210	Screw, Cap, 5/16-18 x 1" long	2
43	J-3542	Block, Slide	1
44	J-3543	Plate, Slide	1
45	J-3557-02	Rail, Slide	1
46	J-3551	Block, Slide	1
47	J-3552	Plate, Slide	1
48	G-1152-106224	Screw, Cap, 5/16-18 x 2 ½ " long	1
49	G-1152-106216	Screw, Cap, 5/16-18 x 1 ¾ " long	1
50	H-2667-16	Plunger, Ball	2
51	G-1202-1065	Elastic Stopnut, 5/16 - 24	4
52	J-3557-01	Rail, Side	1
53	G-1151-109710	Screw, Cap, ½ -20 x 1 " long	4
54	G-1315-06*1.50	Pin, Dowel	4

TRONAIR®

APPENDIX - I

Declaration of Conformity

DECLARATION of CONFORMITY

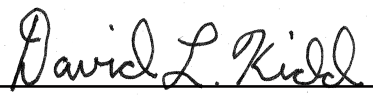
The design, development and manufacture is in accordance with European Community guidelines

Multi-Head Towbars
01-1297-0100
01A1297-0100
01B1297-0100

Relevant provisions complied with by the machinery:
2006/42/EC

Relevant standards complied with by the machinery:
EN ISO 12100-1

Identification of person empowered to sign on behalf of the manufacturer:



Quality Assurance Representative

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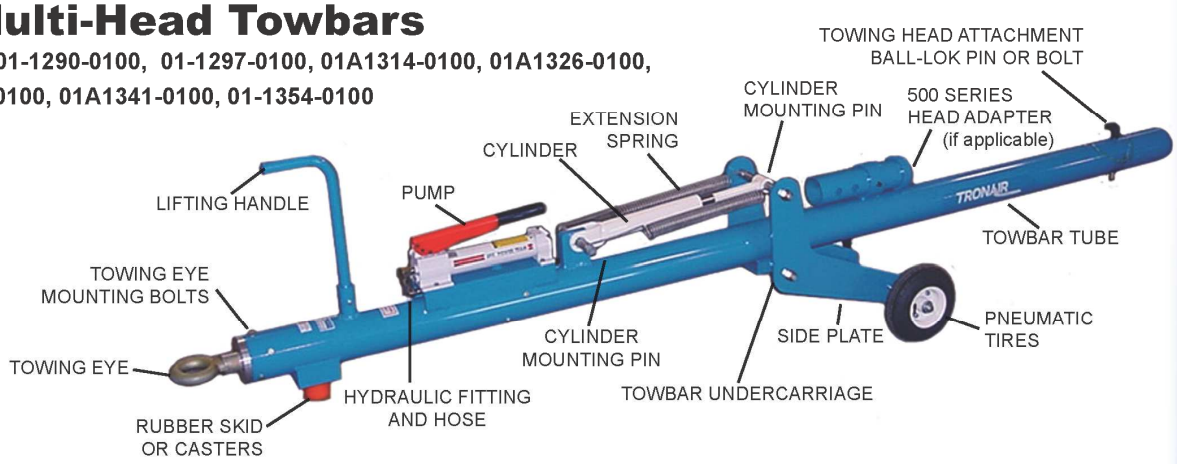
TRONAIR® Maintenance Schedule

Heavy Duty Universal Multi-Head Towbars

Models: 01-1290-0100, 01-1297-0100, 01A1314-0100, 01A1326-0100, 01-1336-0100, 01A1341-0100, 01-1354-0100



Tronair recommends towbar inspections at least once a week.

- ❑ Check towing eye for bending, excessive wear and deformity. If any are located, remove towbar from service and contact Tronair for repair.
- ❑ Check towing eye mounting bolts. Ensure the fasteners are tight and not missing. Tighten to 25 ft-lbs or replace as required.
- ❑ Ensure the towing eye does not move or turn by hand; if the towing eye can turn this may indicate that the centering pin within the shock assembly may be broken and repairs are needed. Contact Tronair for repairs.
- ❑ Check the shock assembly for preload on the spring by pulling on the towing eye. If the shock can be moved by hand this may indicate the spring is worn out, contact Tronair for repairs.
- ❑ Check the rubber skid or casters at the towing eye end. Ensure that all fasteners are tight and not missing. Tighten or replace as required. If the bumper is split or excessively worn, contact Tronair or your Tronair distributor for replacement.
- ❑ Inspect the lifting handle for damage. Contact Tronair or your Tronair distributor for repair or replacement if required.
- ❑ Inspect the towbar tube for cracks, gouges greater than 1/16", and bends or deformities. If any are located, remove towbar from service and contact Tronair for repair.
- ❑ Inspect the pump for hydraulic leaks. Replace seals if any leaks exist. Contact Tronair or your Tronair distributor for replacement.
- ❑ Inspect the pump fluid level. Before adding MIL-PRF-5606 hydraulic fluid, ensure that the undercarriage is collapsed.
- ❑ Inspect hydraulic fittings and hose for leaks. If any hydraulic leaks exist, contact Tronair or your Tronair distributor for replacement.
- ❑ Inspect cylinder for hydraulic leaks. If any hydraulic leaks exist, contact Tronair or your Tronair distributor for replacement seals.
- ❑ Check extension springs. Extend cylinder to full stroke and open relief valve on pump. The extension springs should retract the cylinder completely. If not, contact Tronair or your Tronair distributor for replacement.
- ❑ Inspect cylinder mounting pins for bending or damage. Ensure the springs are engaged on them. If pins are bent or damaged, contact Tronair or your Tronair distributor for replacement.
- ❑ The undercarriage allows towing by a tow vehicle of speeds up to 6 mph (10 km/h)
- ❑ Check the towbar undercarriage for unusual wear or damage. Inflate the pneumatic tires to the proper pressure; repair any air leaks or replace if needed. Ensure the wheels can rotate freely, and wheel rims and tire axle are not bent. Ensure mounting fasteners are tight and not missing. Tighten or replace as required. Grease tire axle every 90 days.
- ❑ Inspect towbar undercarriage side plates for bending or damage. If any exist, contact Tronair or your Tronair distributor for replacement.
- ❑ Inspect head adapter (if applicable) for Tronair 500 series towing heads. Ensure it is not damaged or missing. Contact Tronair or your Tronair distributor for replacement if required.
- ❑ Inspect towing head attachment ball-lok pin or bolt for bending or unusual wear. Verify the factory supplied pin or bolt is used. Contact Tronair for replacement if required. Use only Tronair specified ball-lok pins/fasteners.
- ❑ Ensure the towing head attachment ball-lok pin is connected to the towbar via its lanyard. Replace lanyard if missing.
- ❑ Inspect all steel components for signs of rust. Touch up with paint as required.

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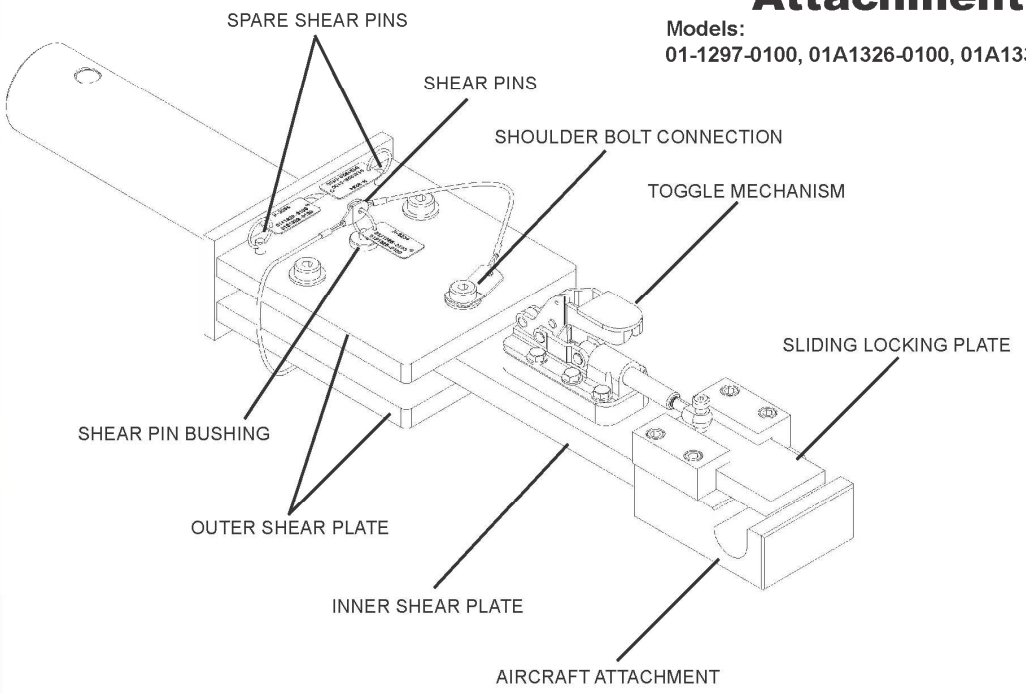
TRONAIR® Maintenance Schedule

Heavy Duty Clamp Style Attachment Heads

Models:
01-1297-0100, 01A1326-0100, 01A1332-0100, 01-1336-0100



Tronair recommends towbar inspections at least once a week.

- ❑ Inspect for weld cracks. If found remove the towbar multi-head from service and contact Tronair for repair.
- ❑ Inspect the side rails, head rail, and head plate for bending. If found remove the towbar multi-head from service and contact Tronair for repair.
- ❑ For towbar multi-heads with shear, inspect the shear plates for bending. If found remove the towbar multi-head from service and contact Tronair for repair.
- ❑ Inspect the sliding locking plate and the toggle mechanism for bending, cracks, and excessive wear. If found remove the towbar multi-head from service and contact Tronair or your Tronair distributor for replacement.
- ❑ Ensure the sliding locking plate can move freely within its housing. If any binding occurs, inspect the sliding locking plate for bending and the housing for flatness. If either condition exists, contact Tronair for repair options.
- ❑ For towbar multi-heads with shear, check the shoulder bolt connections through the shear plates. Verify they are not clamping the shear plates together. There should not be any clamping force applied to the shear plates so the assembly functions properly. If required, back the stopnut off to remove any clamping force applied.
- ❑ For towbar multi-heads with shear, inspect the shear pin. If the shear pin is bent, broken, or missing contact Tronair or your Tronair distributor for replacement. Tronair recommends purchasing spare shear pins for rapid replacement, use only Tronair specified shear pins.
- ❑ For towbar multi-heads with shear, inspect the shear pin bushings. If the shear pin bushings are cracked or chipped, contact Tronair or your Tronair distributor for replacement, use only Tronair specified shear pin bushings.
- ❑ Inspect all steel components for signs of rust. Touch up with paint as required.

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